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Prebiotics from lignocellulosic materials

In the light of increased health consciousness and consumer awareness, nowadays everyone prefers naturally occurring bioactive molecules in place of modern therapeutic agents. During the end of twentieth century, a great concern was expressed for antibiotic residues, transfer of antibiotic resistance genes from animal to human through food chains. The present population believes on “prevention is better than cure” through consumption of naturally occurring bioactive molecules including prebiotics. In the list of prebiotics, xylooligosaccharides (XOS) occupies significant niche because its production process principally relies on lignocellulosic materials those are inexpensive, abundant and renewable in nature. Essentially, XOS is produced from xylan; the second largest biopolymer available on earth. The process of XOS production involves extraction of xylan from lignocellulosic materials/agricultural byproducts such as corn cobs and husk, sugarcane bagasse, natural grass, pigeon pea stalks, green coconut husks etc. The xylan is subsequently hydrolyzed into XOS with different degree of polymerized products such as xylobiose, xylotriose, xylopentose and so on. The major advantages of XOS consumption includes reduction of blood glucose and cholesterol, reduced pro-carcinogenic enzymes in gastrointestinal tract, enhanced mineral absorption from large intestine and immune-stimulation besides selective growth stimulation of beneficial gut microflora. As the xylooligosaccharides are sweet in taste, these could also be used for fortification of dairy products, confectionaries etc. Owing to the ban on antibiotics feed supplement, the XOS could be alternatives to guard gastrointestinal tract from the onslaught of pathogenic microflora. Therefore, the XOS is future sought bioactive molecule for human and animal health.

Biography

A K Samanta is a Doctorate in Animal Nutrition. His innovative research on buffalo gut anaerobic fungi bestowed with prestigious Jawahar Lal Nehru Award in 1999 by ICAR. He has made an endeavor to prepare complete feed blocks for improving rumen fermentation. He has developed enzymatic process for xylooligosaccharides production from the xylan of agricultural wastes and byproducts. Recently, he has received the outstanding ICAR-Interdisciplinary Team Research Award in 2014 for research on prebiotics. He is the Fellow of National Academy of Veterinary Sciences (FNAVS). He is currently undertaking research on therapeutic application of prebiotic, gut microflora, isolation of bioactive carbohydrates etc.

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